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NDM2系列塑壳断路器 产品说明书 NDM2 Series MCCB Product Manual

Nader 良信

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V2.0

Nader 良信

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1. 适用范围与用途/ Application scope

NDM2 系列塑壳断路器(以下简称断路器), 是本公司采用国际先进设计, 制造技术研制、开发的新型断路器之一, 按照其额定极限短路分断能力(Icu)的高低, 分为 C 型, L 型, M 型, H 型四类。

该产品具有体积小、分断高、飞弧短, 抗震动的特点, 是陆地及船舶使用的理想产品, 其额定工作电压至 AC 690V 额定绝缘电压为 1000V, 适用于交流 50/60Hz 的电路中作不频繁转换和电动机不频繁启动之用。

断路器具有隔离功能, 相应符号为: 。

断路器具有过载、短路和欠电压保护功能, 能保护线路及电源设备不受损坏。

本断路器可垂直安装(即竖装), 亦可水平安装(即横装)。

本产品符合标准 IEC 60947-2、GB/T14048.2。

NDM2 series of moulded case circuit breakers(Hereinafter referred to as the MCCBs), which is one of the self-developed new generation MCCB of Nader. According to the level of the rated ultimate short-circuit breaking capacity, the breaker can be classified into four types: Type C (Basic type), Type L (Standard type), Type M (Less high breaking type) and Type H (High breaking type).

The breaker possesses the features such as compactness, high breaking capacity, short arc over and anti-Vibration etc, which is the ideal product for both land and marine use. The rated working voltage is AC 690V, with the insulation voltage of 1000V, will be suitable for in-frequency switching of circuits and starting of motors in 50/60Hz circuit.

The breaker has disconnecting function. The symbol of isolation is: 。

The breaker has functions of overload protection, short circuit protection and undervoltage protection which can protect circuit and electrical power unit properly.

The breaker can be installed vertically(upright), as well as horizontally(crosswise).

The breaker meets the criterions: IEC 60947-2、GB/T14048.2。

2. 规格型号说明/ Model and implication

ND	M	2	-	□	□	□	□	□	□	□	□	□	□	□
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
序号 SN	序号名称 SN Name				NDM2									
1	企业代号 Enterprise code				ND: “Nader” 牌低压电器 Nader low-voltage apparatus									
2	产品代号 Product code				M: 塑料外壳式断路器 Molder case circuit breaker									
3	设计序号 Design SN				2									
4	系列派生代号				X: 小壳体(仅 125) X: Small shell frame AC (Only 125)									
5	壳架等级 Shell frame level				63、125、250、400、630、800									
6	分断能力级别 Breaking level code				C: 基本型 type C: Basic type									
					L: 标准型 type L: Standard type									
					M: 较高分断型 type M: Less high breaking type									
7	操作方式 Operation mode				H: 高分断型 type C: High breaking type									
					无代号: 手柄直接操作 no code represents direct handle operation									

		P:电动操作 P: represents motor operation
		Z:转动手柄 Z: represents rotary handle operation
8	极数 Pole number	2、3、4
9	脱扣器代号 Release form code	0: 无脱扣器 0: represents frame only without trip unit 2: 仅有瞬时脱扣器 2: represents magnetic only 3: 复式脱扣器 3: represents both thermal and matnetic
10	附件代号 Accessory code	参见表 1 see table 1
11	用途代号 For Application code	无代号:配电型 no code represents Power distribution 2: 电动机保护型 2: represents motor protection
12	4 极产品中 N 极(中性极) 形式 N-pole type of four pole product below	A: N 极不安装过电流脱扣器, 且 N 极始终接通 A: N-pole is always close without overload release B: N 极不安装过电流脱扣器, 且 N 极与其它三极一起合分 B: N-pole is open or close together with other three poles and without overload release C: N 极安装过电流脱扣器, 且 N 极与其它三极一起合分 C: N-pole is open or close together with other three poles and with overload release
13	额定电流 Setting current	参见表 2 see table 2
14	接线方式 Cabling type	无代号: 常规产品 No code:Normal product P: 联接排 P:Extended busbar JK: 仅进线端; 接线框式 JK: Wire-in end only: wiring frame type CK: 仅出线端; 接线框式 CK: Outlet end only: wiring frame type K: 接线框式 K: wiring frame type Z1: 板后接线 Z1:Rear-plate connection Z2H: 插入式板后接线 Z2H: plug-in rear-plate connection Z2Q: 插入式板前接线 Z2Q: plug-in front -plate connection Z3H: 插入式板后接线一体式 Z3H: Integrated plug-in rear-plate connection Z3Q: 插入式板前接线一体式 Z3Q: Integrated plug-in front -plate connection

表 1 附件代号
Table 1 Accessory Code

附件名称 Accessory Name	代号 Code
无 None	00
报警触头 Alarm contact	08
分励脱扣器 Shunt release	10
双辅助触头 Double auxiliary contact	20
单辅助触头 Single auxiliary contact	21
欠压脱扣器 Undervoltage release	30
分励脱扣器、双辅助触头 Shunt release and double auxiliary contact	40
分励脱扣器、单辅助触头 Shunt release and single auxiliary contact	41
分励脱扣器、欠电压脱扣器 Shunt release and undervoltage release	50
二组双辅助触头 Two groups of double auxiliary contact	60
二组单辅助触头 Two groups of single auxiliary contact	61
双辅助触头、单辅助触头 Double auxiliary contact, single auxiliary contact	62
欠电压脱扣器、双辅助触头 Undervoltage release, double auxiliary contact	70
欠电压脱扣器、单辅助触头 Undervoltage release, single auxiliary contact	71
分励脱扣器、报警触头 Shunt release, alarm contact	18
双辅助触头、报警触头 Double auxiliary contact, alarm contact	28
欠电压脱扣器、报警触头 Undervoltage release, alarm contact	38
分励脱扣器、单辅助、报警触头 Shunt release, single auxiliary contact, alarm contact	48
单辅助、报警触头 Single auxiliary contact, alarm contact	58
单辅助、报警触头、双辅助触头 Single auxiliary contact, alarm contact, double auxiliary contact	68
欠电压脱扣器、单辅助触头、报警触头 Undervoltage release, single auxiliary contact, alarm contact	78

3. 主要技术参数/ Main technical parameters

表 2/ Table 2

型号/ Type	壳架等级 额定电流 / Frame size /In (A)	额定极限短 路分断能力 / Rated ultimate breaking capacity Icu(kA)	额定运行 短路分断 能力 /Rated operating breaking capacity Ics (kA)	飞弧距 离/ Arcing distanc e (mm)	额定工作电 压/ Rated voltage Ue(V)AC	额定工 作频率/ Rated frequ cy(Hz)	额定 电流/ Rated current In(A)	操作性能 (次)/Opera ting cycles (times)
NDM2-63L	63	36	27		380/400/415		10、12.5、 16、20、 25、32、 40、50、63	电气寿命 Mechanical life 8000 机械免维护寿命 Electrical Without maintenance 20000 机械可维护寿命 Electrical With maintenance 40000
NDM2-63M		52.5	38					
NDM2-63/4P		52.5	38					
NDM2X-125	125	35	26.25	≤50	380/400/415		16、20、 25、32、 40、50、 63、80、 100、125	电气寿命 Mechanical life 8000 机械免维护寿命 Electrical Without maintenance 20000 机械可维护寿命 Electrical With maintenance 40000
NDM2-125C		25	18.75					
		36	27					
NDM2-125L		25	25					
		20	20					
NDM2-125M		52.5	38					
		40	40					
		20	15					
NDM2-125H		85	63.75					
NDM2-125/4P		52.5	38					
NDM2-250C	250	25	18.75	≤50	380/400/415		125、140、 160、180、 200、225、 250	电气寿命 Mechanical life 8000 机械免维护寿命 Electrical Without maintenance 20000 机械可维护寿命 Electrical With maintenance 40000
		36	27					
		25	25					
		20	20					
NDM2-250M		52.5	38					
		40	40					
		20	15					
NDM2-250H		85	63.75					
NDM2-250/4P		52.5	38					

续表 2 / Table 2 (continued)

型号/ Type	壳架等级 额定电流/ Frame size /In (A)	额定极限短 路分断能力 / Rated ultimate breaking capacity Icu(Ka)	额定运行短 路分断能力 /Rated operating breaking capacity Ics (kA)	飞弧距离 / Arcing distance (mm)	额定工作电 压/ Rated voltage Ue(V)AC	额定工 作频率/ Rated frequ ncy(Hz)	额定 电流/ Rated current In(A)	操作性能 (次)/Operati ng cycles (times)	
NDM2-400C	400	35	26.25	≤100	400/415	50/60	225、250、 315、350、 400	电气寿命 Mechanical life 7500 机械免维护寿命 Electrical without maintenance 10000 机械可维护寿命 Electrical with maintenance 20000	
NDM2-400L		50	37.5						500
NDM2-400M		65	48.75						
		50	50						
NDM2-400H		100	75		400/415				
NDM2-400/4P		65	48.75						50/60
NDM2-630C	630	35	26.25	400/415		400、500、 630			
NDM2-630L		50	37.5		500				
NDM2-630M		65	48.75				690		
		30	30						
NDM2-630H		100	75	400/415					
NDM2-630/4P		65	48.75		630、700、 800				
NDM2-800M	800	75	56.25			400/415	电气寿命 Mechanical life 7500 机械免维护寿命 Electrical without maintenance 10000 机械可维护寿命 Electrical with maintenance 20000		
		20	15	690					
NDM2-800H		100	75		400/415				
NDM2-800/4P		75	56.25						

4. 正常工作环境/ Stand working conditions

- 1)海拔 ≤ 2500m;
 - 2)环境温度-35 ~ +70°C;
 - 3)环境温度+40°C时相对湿度不超过 50%，较低温度可以有较高湿度，如：20°C时相对湿度可达 90%；
 - 4)对于因温度变化所产生的凝霜应采取相应的措施；
 - 5)能耐受潮湿空气的影响；
 - 6)能耐受盐雾、油雾的影响；
 - 7)能耐受霉菌的影响；
 - 8)断路器接至主回路的安装类别为 III 类，断路器不接至主回路的安装类别为：II 类；
 - 9)污染等级：3 级；
 - 10)防护等级：IP20；
 - 11)无爆炸危险的介质中，且介质无足以腐蚀金属和破坏绝缘的气体与导电尘埃的地方；
 - 12)在设有雨雪侵袭的地方；
 - 13)当用户使用条件较上述严酷时应与制造商协商；
 - 14)储存环境 见表 3；
 - 15)产品降容系数表 见表 4；
 - 16)高海拔降容系数 见表 5；
 - 17)导体部分接线端子/安装螺钉拧紧扭矩 见表 6；
- 1) Altitude ≤ 2500m;
 - 2) Ambient temperature: -35 ~ +70°C;
 - 3) The relative humidity of the air does not exceed 50% at 40°C. Higher relative humidity is permitted at lower temperature, such as 90% relative humidity at 20°C;
 - 4) The protective actions should be taken for frost which formed by variation of temperature;
 - 5) Resisting the effects by humid air;
 - 6) Resisting effects by salt mist and oil mist;
 - 7) Resisting the effects by mould;
 - 8) Installation category for the breaker which is connected to main circuit: III, Installation category for the breaker which is not connected to main circuit: II;
 - 9) Pollution degree: 3;
 - 10) Protection degree: IP20;
 - 11) Service place without explosive media, gas and dust which are corrosive and conductive;
 - 12) Be mounted free from rain and snow;
 - 13) Should consult with the manufacturer when the working conditions are harsher;
 - 14) Storage environment table 3;
 - 15) Product derating coefficient table 4;
 - 16) Derating coefficient in high altitude place table 5;
 - 17) Terminal torsion value for wiring thread hole in conductor section table 6;

表 3/ table3

项目 Item	规范 Description
周围温度 Ambient temperature	-40°C ~ +75°C
相对湿度 Relative humidity	(Ambient temperature at 25°C) ≤ 95%

表 4/ table4

塑壳式断路器降容系数表 Molded Case Circuit Breaker Derating Coefficient Table

序号 No.	壳架等级 额定电流(A) Frame size rated current(A)	温度对应产品降容系数表 Derating coefficient table						
		40°C	45°C	50°C	55°C	60°C	65°C	70°C
1	63	1	0.979	0.958	0.937	0.915	0.893	0.871
2	125	1	0.977	0.954	0.931	0.907	0.883	0.858
3	250	1	0.982	0.963	0.944	0.924	0.904	0.882
4	400	1	0.981	0.962	0.942	0.922	0.901	0.879
5	630	1	0.979	0.958	0.937	0.915	0.893	0.871
6	800	1	0.980	0.960	0.939	0.918	0.897	0.877

表 5/ table5

塑壳断路器高海拔降容系数表

Molded Case Circuit Breaker Derating Coefficient Table in High altitude Place

海拔高度(m) Altitude(m)	2000	2500	3000	3500	4000	4500	5000
工作电流修正系数 Rated working current	1	1	0.98	0.97	0.95	0.94	0.93
最大工作电压(V) Maximum working voltage(V)	690	690	620	580	550	520	500
工频耐压(V) Power frequency withstand voltage(V)	3500	3500	3150	3000	2800	2650	2500
绝缘电压(V) Isolation voltage(V)	1000	1000	900	850	810	770	730

表 6/ table 6

接线端子/安装螺钉拧紧扭矩 Torsion value for wiring terminal

序号 No.	壳架等级额定电流(A) Frame size rated current	螺纹直径(mm) Thread diameter	扭矩(N.m) Torsion value
1	63	M5	4
		M3	1
2	125	M8	12
		M4	2.4
3	250	M8	12
		M4	2.4
3	400	M10	20
		M6	6
4	630	M12	28
		M6	6
5	800	M12	28
		M6	6

5. 接线方式/ Wiring Method

连接导线采用的截面积和相适应的额定电流见表 7

Table 7 of sectional area and applicable rated current adopted in wiring

额定电流(A) Rated current(A)	10 12.5	16 20	25	32	40 50	63	80	100	125 140	160	180 200 225	250	315 350	400
导线截面积 Wire sectional area(mm ²)	1.5	2.5	4.0	6.0	10	16	25	35	50	70	95	120	185	240

额定电流(A) Rated current(A)	电缆线截面积 Cable cross-sectional area		铜排尺寸 Copper bar size	
	数量 Quantity	截面积(mm ²) Cross-section area(mm ²)	数量 Quantity	尺寸 (mmxmm) Cross-section area(mmxmm)
500	2	150	2	30x5
630	2	185	2	40x5
700、800	2	240	2	50x5

6. 产品外形及安装尺寸/ Shape dimension & Dimension

本产品可板前接线，也可板后接线，具体见图 1、图 2

This product can also be front plate connector, wiring on back of the board, specific see Figure 1, figure 2

图 1 板前接线/ Fig 1 Front connection

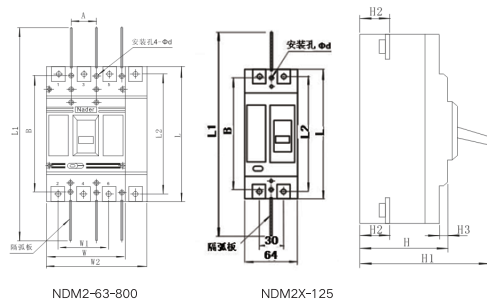


图 2 板后接线/ Fig 2 Rear connection

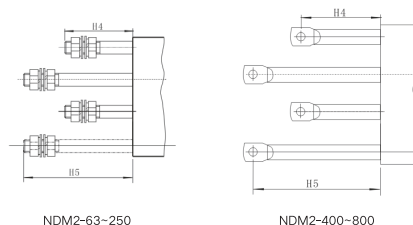


表 8/ Table 8

型号/ Table	外形尺寸/Dimensions												安装尺寸/ Mounting dimensions		
	板前接线/ Front connection												板后接线/ Rear connection		
	W	W1	L	H	W2	L1	H1	H2	H3	L2	H4	H5	A	B	Φd
NDM2-63L	78	50	135	74	-	234	90.5	20.5	7	117	54	79	25	117	3.5
NDM2-63M	-	-	81.5	103	98.5		27.5	25							
NDM2-63/4P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NDM2-125C(L)	92	60	-	69	-	-	86	-	-	-	-	-	30	-	-
NDM2X-125	64	30	150	-	-	250	-	24	7	132	53	73	-	129	4.5
NDM2-125M	90	60	-	87.5	-	-	104	-	-	-	-	-	30	-	-
NDM2-125H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NDM2-125/4P	-	-	-	-	-	122	-	-	-	-	-	-	-	-	-
NDM2-250C	-	-	-	86	-	-	110	-	-	-	-	-	-	-	-
NDM2-250L	-	-	-	-	-	-	291	-	24	5	144	58	78	35	126
NDM2-250M	107	70	165	-	-	103	-	127	-	-	-	-	-	-	-
NDM2-250H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NDM2-250/4P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

续表 8/ Table 8(continued)

型号/ Table	外形尺寸/ Dimensions												安装尺寸/ Mounting dimensions		
	板前接线/ Front connection												板后接线/ Rear connection		
	W	W1	L	H	W2	L1	H1	H2	H3	L2	H4	H5	A	B	Φd
NDM2-400C															
NDM2-400L	150														
NDM2-400M		96	257	106.5	-	475	157	38	9	223.6	42	82	44	194	7
NDM2-400H															
NDM2-400/4P	-					198									
NDM2-630C															
NDM2-630L	182	116	270	110.5	-	488	159	43	8	234	44	88	58	200	7
NDM2-630M															
NDM2-630H															
NDM2-630/4P	-					240									
NDM2-800M	210	140	280	115.5	-	498	159	40(进)/43(出)	11.5	243	33	98	70	243	7
NDM2-800H															
NDM2-800/4P	-					280									

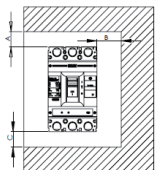
注：未注公差尺寸的极限偏差按 GB/T 1804-c。

Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

6.1 安装在金属小柜中的绝缘距离(单位: mm), 如下图:

6.1 Insulation distance mounted in the metal cabinet (unit: mm), as shown below:

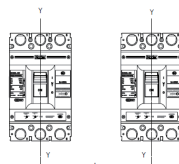
安装距离 Mounting distance	A(进线端到柜面) A (inlet wire end to the cabinet face)		B(侧面到柜面距 离) B (distance from side to cabinet)	C(出线端到柜面距 离) C (outlet wire end to the cabinet face)
	带端子罩 With a terminal cover	不带端子罩 Without a terminal cover		
NDM2-63	25	65	30	30
NDM2(X)-125	25	65	30	30
NDM2-250	25	65	30	30
NDM2-400	25	120	35	35
NDM2-630	25	120	35	35
NDM2-800	25	120	35	35



6.2 断路器排装之间的最小中心距离

6.2 Minimum center distance between rowed circuit breakers

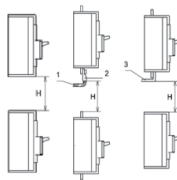
型号 Specification	断路器宽度(mm) Width of circuit breaker (mm)			中心距离(mm) Center distance (mm)		
	2极 2P	3极 3P	4极 4P	2极 2P	3极 3P	4极 4P
NDM2-63	/	78	103	/	108	133
NDM2-125	/	92	122	/	122	152
NDM2X-125	64	/	/	108	/	/
NDM2-250	/	107	142	/	137	172
NDM2-400	/	150	198	/	190	238
NDM2-630	/	182	240	/	222	280
NDM2-800	/	210	280	/	250	320



6.3 断路器叠装之间最小距离

6.3 Minimum center distance between stacked circuit breakers

	H(断路器上下距离) H (distance of circuit breaker from bottom)	
	带端子罩 With a terminal cover	不带端子罩 Without a terminal cover
NDM2-63	90	90
NDM2(X)-125	90	91
NDM2-250	90	93
NDM2-400	155	155
NDM2-630	155	155
NDM2-800	155	155



- 注: 1、电缆绝缘联接
2、联接且无绝缘
3、产品通电前检查端子罩或相间隔板装配到位。

Note: 1. Cable insulating connection
2. Connection without insulation
3. Check whether the terminal cover or phase partition is assembled properly before products are energized.

7. 安装方式/ Mounting Method

7.1 绝缘测试

本断路器出厂前已按标准规定绝缘测试。安装前如进行复测，必须按如下步骤：

- ① 用 500VDC 兆欧表
- ② 在断路器处于断开状态，对进出连接板 1-2、3-4、5-6 之间，和 1、3、5 连接板与外壳之间(外壳用金属箔覆盖)分别进行。
- ③ 对接至主电路的欠电压脱扣器，在进线与断路器外壳间。
- ④ 绝缘电阻不小于 20MΩ。

7.2 安装

请安装在金属阻燃物上，断路器可垂直安装，也可以水平安装。

7.1 Insulation test

Insulation test has been already carried out on the breaker according to standard before leaving factory. Due to wire circuit, the following steps should be operated if insulation test is carried out on the breaker again.

- ① 500VDC megger
- ② When breaker is broken up, insulation test is conducted separately between connecting panels 1-2, 3-4, 5-6, connecting panels 1, 3, 5 and shell.
- ③ Undervoltage tripper connected to the main circuit is arranged between intake wire and breaker shell.

- ④ Insulation resistance is not less than 20MΩ.

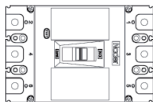
Notes: Insulation test could be operated after wire circuit is separated.

7.2 Install

Installed on metal or other flameproof material in vertical or horizontal mode.



垂直安装
Vertical



水平安装
Horizontal

8. 附件说明书/ Accessory

8.1 欠压脱扣器

断路器带有欠压脱扣器时，应使欠电脱扣器先通电，断路器才允许合闸。

根据外挂电压模块上的接线端子编号接入电源(直流电源不必区分正负极)

当电源电压下降到欠压脱扣器额定工作电压的 35% ~ 70%

范围内时，欠压脱扣器能可靠的分断断路器；当电源电压低于欠压脱扣器额定工作电压的 35% 时，欠压脱扣器能防止断路器闭合；当电源电压高于欠压脱扣器额定工作电压的 85% 时，欠压脱扣器能保证断路器可靠闭合。

8.1 Undervoltage tripper

When the breaker has an undervoltage tripper, the undervoltage tripper should be electrified, and then the breaker allows switch on.

Power supply is accessed according to wiring connector number on the external undervoltage module (anode and cathode of DC power supply are not differentiated).

When power voltage declines to 35% ~ 70% of the rated working Voltage of undervoltage tripper, the undervoltage tripper can reliably break the breaker up; when power voltage is lower than the rated working voltage of undervoltage tripper by 35%, the undervoltage tripper can prevent the breaker from closing; when power voltage is higher than the rated working voltage of undervoltage tripper by 85%, the undervoltage tripper can guarantee the reliable closure of breaker.

8.2 分励脱扣器

根据引出的导线编号接入电源(直流电源不必区分正

负极)。当分励脱扣器的外加电压介于额定控制电源电压的 70%~110% 之间时，能可靠分断断路器。

8.2 Shunt tripper

Power supply is accessed according to wiring connector number on the external undervoltage module (anode and cathode of DC power supply are not differentiated). When impressed voltage of shunt tripper is between 70% and 110% of rated control power voltage, the breaker can be reliably broken.



电源输入 Power input

欠压脱扣器接线图

Wiring diagram of under-voltage release



电源输入 Power input

分励脱扣器接线图

Wiring diagram of shunt tripper

8.3 辅助触头、报警触头

8.3.1 辅助、报警触头接入相应外围控制电路

8.3.1 Auxiliary contact, alarm contact

8.3.1 Auxiliary and alarm contacts accessed into relative external control circuit/

分 类 Category	壳架电流 (A) Frame current (A)	约定发热电流 Ith (A) Conventional thermal current (A)	额定工作电流 (A) Rated working current (A)
辅助触头 Auxiliary contact	63、125、250、 400、630、800	3	1.5A(AC400V)
报警触头 Alarm contact			0.15A(DC220V)
		3	0.3A(AC400V)
			0.15A(DC220V)

8.3.2 辅助、报警触头状态指示图

8.3.2 Status indicator diagrams of auxiliary and alarm contacts

附件名称 Accessory Name	断路器状态 Status of breaker	线路接通状态 Connection status of circuits
辅助触头 Auxiliary contact	“分”或“自由脱扣” Breaking or free tripping	
	“合” Closing	“接通”与“断开”相互转换 Switchover between closing and opening
报警触头 Alarm contact	“分”或“合” Breaking or closing	
	“自由脱扣” Free tripping	“接通”与“断开”相互转换 Switchover between closing and opening

8.4 电动操作机构

在外加电源情况下，可通过电动操作机构对断路器进行合、分操作。

8.4 Motor-operated mechanism

The breaker can be closed and opened by an motor-operated mechanism in the condition of external power supply.

8.5 手动操作机构

8.5.1 安装前，安装操作手柄的开关柜门按图开好孔，开孔

中心离铰链距离大于 200 mm。

8.5.2 把已在面盖上固定好操作机构的断路器安置于安装板上，并稍作固定。

8.5.3 把操纵杆方轴固定于操作机构上安置方轴的方孔内。

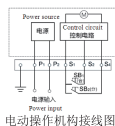
8.5.4 关上开好孔的门板，调整断路器的位置，使方轴中心与手柄开孔中心一致。

8.5.5 打开开关柜门板，当转动手柄“OFF”指示在水平位置时固定好手柄。

8.5.6 合上安装好转动手柄的开关柜门板，试着操作手柄，转动应灵活自如，并且手柄在水平位置时，断路器应分闸，手柄在垂直位置时，断路器应合闸。

8.5 Manual operating mechanism

8.5.1 Before installation, a switch cabinet door for installing operating handle is holed in accordance with the diagram.



Wiring diagram of motor-operated mechanism

Distance between the holed part and the hinge is greater than 200 mm.

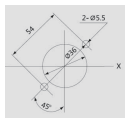
8.5.2 The breaker with an operating mechanism fixed on cover is installed on the installation panel and slightly fixed then.

8.5.3 The square shaft of an operating rod is fixed in a square hole on the operating mechanism.

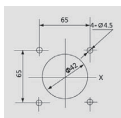
8.5.4 he holed door plank is closed and position of the breaker is adjusted so that centers of the square shaft and the handle hole are aligned.

8.5.5 The switch cabinet door is opened. The rotary handle is fixed until “OFF” is at the horizontal position.

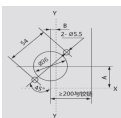
8.5.6 The switch cabinet door equipped with rotary handle is closed. The handle should be operated freely. The breaker should be opened when the handle is at the horizontal position, and it should be closed when the handle is at the vertical position.



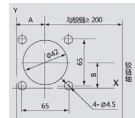
CS1-A type holeing diagram of handle



CS1-F type holeing diagram of handle



CS2-A type holeing diagram of handle



CS2-F type holeing diagram of handle

9. 使用和维护/ Application & Maintenance

9.1 运行前检查和准备

运行前应检查以下各项

- (1)核对接线是否正确，见第 7 点接线方式图。
- (2)确认端子间或暴露的带电部分没有短路或对地短路情况。
- (3)确认端子连接和固定螺钉均应紧固无松动
- (4)断路器带有欠电压脱扣器，应使脱扣器先通电，断路器才允许合闸。

9.1 Examination and preparation before working

The following items should be examined before working

- (1)Check whether wiring is right; see the seventh wiring diagram.
- (2)Make sure that there is no short circuit on the part between every two terminals or on exposed electrified parts or no short circuit. to earth.
- (3)Make sure terminal connection and fixing screw are fastened.
- (4)If the breaker has an undervoltage tripper, the breaker is allowed to close only when the undervoltage tripper is electrified.

9.2 试运行 Pilot run

按 9.1 条各项全部确认无异常情况后，可以进行试运行。

(1)扳动操作手柄，投入电源。

(2)断路器主电路带电后，按紧急脱扣按钮，断路器应脱扣，操作手柄处于脱扣位置。如果试运行都能满足，可投入运行。

Carry out pilot run after all items in rule 9.1 are assured normal.

(1) Pull the operating handle and switch power supply on.

(2) Press emergency release button after main circuit of the breaker is electrified. Then, the breaker should be released and the operating handle is at released position. Operation can be carried out if pilot run successes.

9.3 维护 Maintenance

◆ 维护检查必须有专业技术人员负责。

◆ 用户如需选用内、外附件，按所订型号由本公司提供，以保证质量。如用户自行选购或改装，本公司不能负责。

◆ 在执行维护操作前，必须先完成下列操作：

(1) 使断路器分闸；

(2) 断开电源与断路器的连接(包括主电路、辅助电路)

(3) 将断路器从安装位置上卸下(一般用于插入式，固定式最好也如此)。

断路器维护在正常操作条件下每年一次，在非正常条件下每半年一次，以下为维护内容：

(1) 再扣断路器，合、分断路器，在断路器合闸时用脱扣按钮使断路器脱扣，往复操作 5 次，断路器应能可靠进行再扣、合、分、脱扣动作；

(2) 清除断路器表面及连接处的灰尘(用清洁、干燥的抹布擦拭)；

(3) 清洁隔弧板，如必要则需要更换隔弧板；

(4) 检查所有连接情况，用砂布擦除氧化物，用可溶解剂清洁，拧紧螺栓和螺母；

(5) 如果断路器还装有其它内、外部附件，应逐一检查各个附件，以确保其处于正常工作状态。

(按照 8 附件说明详细内容进行测试)

◆ Maintenance and check should be finished by professional technicians.

◆ To guarantee quality, the company provide internal and external accessories to customer according to the subscribed type. The company is free from responsibility if the customer purchases or refits internal and external accessories by himself.

◆ The following operations should be finished before maintenance.

(1) Open the breaker.

(2) Disconnect power supply and the breaker (including main and auxiliary circuits);

(3) Uninstall the breaker from the installing position (suitable for insertion type, so as fixation type).

Maintenance on the breaker should be carried out once every year in normal operation condition or once every half a year in an abnormal condition. The followings are included in maintenance.

(1) Fasten, close and break the breaker. Release the breaker by a release button when it is closed.

The breaker should be fastened, closed, broken and released reliably again after the above operations are carried out for five times;

(2) Remove dust on the surface and connection part of the breaker (by clean and dry cloth);

(3) Clean flash barrier, and exchange it if necessary;

(4) Check all connections; wipe oxide off by abrasive cloth; clean by dissolvable lotion; tighten the bolt and nut;

(5) If there are other accessories installed on the breaker, all accessories should be examined one by one to make sure normal working condition.

(test in according to details in Accessory 8)

10. 注意事项/ Notices

10.1 安装注意事项

(1) 断路器本体、底座(板后接线用)、底座(插入式接线用)固定在安装板上。

(2) 与主电路连接

2.1. 必须由具有专业资格的人员进行配线作业。

2.2. 确认输入电源处在完全断开的情况下，才能进行配线作业。

2.3. 必须安装本体后再进行配线。

2.4. 断路器配线必须符合上下进出，即 1,3,5 端子接电源线，2,4,6 端子接负载端，允许倒进线

10.1 Installation precautions

(1) Main body, baseboard (for back-panel wire connection), base (for insertion wire connection) of the breaker are fixed on an installation panel.

(2) Connected to main circuit.

2.1. Wiring operation should be carried out by professional technicians.

2.2. Wiring operation should be carried out only when input power supply is assured completely broken.

2.3. Wiring operation should be carried out after the main body is installed.

2.4. In wiring operation of the breaker, wire should be inserted from the top and pulled out from the bottom; that is to say, terminals 1,3,5 are connected to power wire, and terminals 2,4,6 are connected to load wire; wiring sequence is allowed to be exchanged.

10.2 运行注意事项

(1) 湿手不能操作断路器，否则可能发生电击事故。

(2) 断路器不能频繁操作，否则会缩短断路器的使用寿命。

(3) 带电动操作机构的断路器脱扣跳闸后，电操机构必须使断路器再扣，然后才能合闸。

10.2 Running precautions

(1) Wet hand is forbidden to operate the breaker, otherwise there is electric shock hazard.

(2) The breaker cannot be operated frequently, otherwise its service life is shortened.

(3) If there are release and tripping operation occurred on the breaker with an motor-operated mechanism, the breaker only can be closed after the motor-operated mechanism fastened it again.

10.3 保修期与售后服务

本产品是在完善的质量管理体系下制造的，当万一发生故障时，对保修期与售后服务特作如下说明：
保修期

在用户遵守保管和使用条件下，从本公司发货之日起，不超过 36 个月，断路器封印完好，产品如因制造质量问题而发生损坏或不能正常使用，本公司负责无偿修理或更换。但是，如由于下述原因引起的故障，即使在保修期内亦作有偿修理或更换。

(1) 由于使用错误、自行改装及不适当的维修等原因。

(2) 超过标准规范的要求使用。

(3) 购买后由于摔落及安装过程中发生损坏等原因。

(4) 地震、火灾、雷击、异常电压、其他天灾及二次灾害等原因。

售后服务

(1) 出现故障时，请与供货商或本公司售后服务部门联系。

(2) 保修期内的修理或更换：由于本公司制造上的问题所造成的故障，作无偿修理，以至更换。

(3) 超过保修期后的修理或更换：在修理后能维持功能的场合下，作有偿修理，否则可作有偿更换。

10.3 Warranty period and after-sales service

This product is manufactured in a fine quality management system. In case of error, warranty period and after-sales service are explained in the followings:

Warranty period

The company is responsible for free maintenance or exchange within 18 months from the delivery date at the following premises: the user abides by preservation and use rules; seal on the breaker is complete; the product is damaged or cannot be used normally by reason of quality problem. However, maintenance or exchange should be paid in warranty period if the error is caused by any one of the following reasons:

- (1) Improper use, self refit, improper maintenance and so on.
- (2) Use out of the standard specification.
- (3) Damage caused by falling off or installation after purchase.
- (4) Earthquake, fire disaster, lightning stroke, abnormal voltage, other natural disaster, second disaster and so on.

After-sales service

- (1) Please contact the supplier or the after-sales service department of company if there is an error.
- (2) Maintenance or exchange in warranty period: free maintenance or exchange is allowed if the error is up to manufacture technique.
- (3) Maintenance or exchange out of warranty period: paid maintenance is operated if the function can be recovered, otherwise paid exchange is operated.

11. 订货须知/ Accessory list and installation

用户务必确认对本产品技术资料已有详细了解，并应根据断路器将来使用的场合，按“订货规范”表订货。

Customer should have a knowledge of technical documents of this product and maker order by an “Ordering rule” table in accordance with the future practical use of breaker